Temporal variability of live (stained) benthic foraminiferal faunas in a river-dominated shelf – Faunal response to rapid changes of the river influence (Rhône prodelta, NW Mediterranean)

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Résumé en anglais	In the context of the French research project CHACCRA (Climate and Human-induced Alterations in Carbon Cycling at the River-seA connection), living (rose Bengal-stained) benthic foraminifera were investigated at two stations (24 and 67 m depth) in the Rhône prodelta (NW Mediterranean, Gulf of Lions). The aim of this study was to precise the response of benthic foraminiferal faunas to temporal changes of the Rhône River inputs (e.g. organic and terrigeneous material). Each site was sampled in April 2007, September 2007, May 2008 and December 2008, permitting to observe foraminiferal faunas of the 63–150 and >150 µm size fractions under a wide range of environmental conditions. Obvious variations in foraminiferal faunal composition were observed during the four investigated periods at the shallowest Station A located in the close vicinity of the Rhône River mouth. After major Rhône River flood events, different colonisation stages were observed with foraminiferal faunas responding with an opportunistic strategy few days to weeks after the creation of a peculiar sedimentary environment (Leptohalysis scottii, May 2008) or high organic matter supplies (Ammonia tepida, December 2008). Under more stable conditions, relatively diverse and equilibrated faunas grew in the sediments. Species benefited from noticeable input of riverine phytodetritus to the sediment during spring bloom conditions (April 2007; e.g. Bolivina dilatata, Nonionella stella, Stainforthia fusiformis), or high amounts of still bio-available organic matter under more oligotrophic conditions (September 2007; e.g. Ammonia tepida, Psammosphaera fusca). The reduced influence of the Rhône River input at the farther Station N led to less contrasted environmental conditions during the four sampling periods, and so to less obvious variations in foraminiferal faunal composition. During reduced riverine influence (i.e. low Rhône discharge), species able to feed on fresh phytodetritus (e.g. Clavulina cylindrica, Hopkinsina atlantica, Nonionella iridea and Nonionella turgida) benefited from eutrophic conditions of the spring bloom (April 2007, May 2008). Conversely, the occurrence of Nouria polymorphinoides under oligotrophic conditions (September 2007, December 2008) was indicative of a benthic environment potentially disturbed by bottom currents. This study put into evidence the extremely rapid response of benthic foraminiferal faunas to strong variations in environmental conditions mostly induced by the Rhône dynamics.
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